Alaska Department of Fish and Game
Division of Wildlife Conservation
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Northern Goshawk Monitoring, Population Ecology and Diet on the Tongass National Forest

1 July 2000–30 September 2001

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Annual Research Performance Report
Endangered Species Conservation Fund
Federal Aid Grant SE-4-2, Study 6/7

This is a progress report on continuing research. Information may be refined at a later date.

FEDERAL AID
ANNUAL RESEARCH PERFORMANCE REPORT

PROJECT TITLE: Northern Goshawk Monitoring, Population Ecology and Diet on the Tongass National Forest

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COOPERATORS: US Forest Service and US Fish and Wildlife Service

GRANT AND SEGMENT NR.: SE-4-2-6/7

SEGMENT PERIOD: 1 July 2000 – 30 June 2001; 1 July 2001 – 30 September 2001

STATE: Alaska

WORK LOCATION: Douglas and Ketchikan

I. PROGRESS ON PROJECT OBJECTIVES

OBJECTIVE 1: Monitoring of northern goshawk (*Accipiter gentilis*) nesting areas in cooperation with USDA Forest Service (FS).

Goshawks are an important monitoring component associated with the 1997 revision of the Tongass Land and Resource Management Plan for the FS. The FS has instituted an interagency goshawk-monitoring plan associated with their requirement to protect and conserve habitats for goshawks to ensure that they remain viable and well distributed on the Tongass National Forest. Resource agencies are also interested in conserving and managing for goshawks so that there is no need to list the species under the Endangered Species Act (ESA). This project is the primary data-gathering component of a multi-agency effort devoted to long-term monitoring of goshawk nesting areas and determination of goshawk movements based on radiotelemetry data. ADF&G staff continued to play a supportive role in FS nest monitoring efforts.

OBJECTIVE 2: Analysis of 1991 – 1999 goshawk nesting area monitoring data and analysis of goshawk morphometric data with an evaluation of subspecific status of the Queen Charlotte Goshawk (*Accipiter gentilis laingi*).

In previous reports we provided summaries of yearly monitoring efforts, nest occupancy, and nest fidelity data. Compilation of this data over the entire study period (i.e., 1991 – 1999) will provide a more thorough analysis of these important components of goshawk nesting ecology. Because nest-monitoring efforts began to decrease after the 1999 breeding season, data collected since then were excluded from these analyses.

Morphometric measurements (i.e., size characteristics) have been collected from goshawks captured for the radiotelemetry portion of this study. An analysis based on morphometric data collected since 1992 will allow evaluation of the subspecific status of goshawks in Southeast Alaska. This information will assist the FWS in their effort to conserve and manage this subspecies.

OBJECTIVE 3: Description of breeding season diet of goshawks in Southeast Alaska.

ADF&G, FS and FWS jointly funded this study in which M.S. student Lewis used small, remote cameras and video recorders to identify prey brought to goshawk nests. From these data, we will determine the types of goshawk prey species that are associated with old-growth coniferous forests in Southeast Alaska.

OBJECTIVE 4: Preparation of scientific presentations and reports for publication.

II. SUMMARY OF WORK COMPLETED ON JOBS IDENTIFIED IN ANNUAL PLAN THIS PERIOD

JOB 1: Searching for active goshawk nests and capturing goshawks.

This objective was met to the degree possible. After the 1999 breeding season, ADF&G decided to allow FS staff to take the lead on monitoring efforts. During the 2000 breeding season, a lack of consistent effort among FS District Offices led to fewer nests being checked than recent years.

Nine active goshawk nests were identified on the Tongass in 2001. Six occurred within previously documented nesting areas and 3 occurred within new nesting areas (Big Creek [on Mitkof Island], Thorne Island, and Vank Island) located this year. With the discovery of 3 new nesting areas in 2001, the cumulative number of nesting areas documented in Southeast Alaska increased to 65.

During 2001, ADF&G personnel captured 4 goshawks (2 adult, 2 juveniles) at 3 nest sites in Southeast Alaska. One adult male goshawk captured at Thorne Island nesting area was fitted with a tail-mounted radio transmitter. Two goshawks (1 adult, 1 juvenile) were instrumented with satellite transmitters (PTTs) during 2001; an adult female that nested on Douglas Island (Blueberry Hill nesting area) and one of her progeny, a juvenile female. Satellite tracking of these PTTs indicates that both transmitters were stationary over several months, indicating that both birds had died or dropped their PTTs. A juvenile male goshawk from Mitkof Island (Big Creek nesting area) was captured and banded with USFWS numerical bands but no transmitter was put on this bird. Significant field efforts were made to re-capture an adult female goshawk at Duncan Creek nesting area (Kupreanof Island). There was a desire by FS staff to have the adult female re-captured and the adult male captured so that transmitters (either radio or PTT) could be fit to each bird. We were unsuccessful in these attempts.

JOB 2: Analysis of goshawk nesting area monitoring data to assess nest monitoring efforts, nest occupancy and fidelity and inter-nest movements; analysis of morphometric data to evaluate subspecific status of goshawks in Southeast Alaska.

The first portion of this objective was met. Data gathered from nest monitoring efforts from 1991 – 1999 were compiled and analyzed. Mean occupancy of nest sites was 28.4% ± 7.6 (SE) per year in Southeast Alaska for nesting areas monitored for ≥ 5 years but varied among Tongass Management Areas (Ketchikan = 13.0% ± 9.2; Stikine = 20.0% ± 13.0; Chatam = 53.2% ± 15.0). Nesting area fidelity and mate fidelity were moderate for radiotagged female goshawks and high for radiotagged adult goshawks. This can be explained by mate abandonment and movement to different nesting areas in 35.7% of consecutive year events for females; no males moved to different nesting areas in this study. Distances moved between active nests in consecutive years ranges from 0.05 – 3.2 km within the same nesting area and 3.62 – 152 km between nesting areas. These results have been already reported in detail.

The second portion of this objective was met. Morphometric data gathered from 68 adult and 70 juvenile goshawks during capture events from 1992 – 1999 were used for this analysis. Mean wing cords were smaller in Southeast Alaska than those reported for other areas of Alaska, but larger than those reported from coastal British Columbia. Our results generally support the original description of *A. g. laingi*. These data were presented at the American Ornithologists' Union annual meeting in Seattle, August 2001 (see Job 4).

JOB 3: Analysis of prey delivery, prey remains, and pellet data to quantitatively describe the diet of goshawks in Southeast Alaska.

This objective was completed when Master's student Lewis completed and defended his thesis (Lewis, S.B. 2001. Breeding season diet of northern goshawks in Southeast Alaska with a comparison of techniques used to examine raptor diets. Thesis. Boise State University. Boise, Idaho. 124p.). This thesis contained information on the use of a video surveillance system for monitoring raptor nests in a temperate rainforest environment, a comparison of three techniques used to assess raptor breeding season diets, and a quantitative description of the goshawks breeding season diet in Southeast Alaska. In Southeast Alaska, goshawks exhibit a pattern of adaptability to differing prey assemblages similar to patterns seen at other spatial levels. This flexibility allows goshawks to occupy areas of Southeast Alaska with variable prey bases. However, there is an apparent limit to this adaptability. On Prince of Wales Island, which has the most restricted prey base for goshawks, few occupied nests have been found and use-areas of these goshawks are the largest ever recorded for the species in North America. While other factors (e.g., timber harvest) undoubtedly play a role, this suggests that finding sufficient food is difficult for goshawks attempting to breed on this island.

JOB 4: Preparation of scientific presentations and reports for publication.

This objective was partially met with presentations given at a national ornithology conference. Given the large and variable amount of data gathered on goshawk ecology and movements collected through the 1999 breeding season, nothing was submitted for peer-reviewed publication pending completion of analyses.

Two presentations were prepared and given at the 2001 annual meeting of the American Ornithologists' Union in Seattle, Washington.

1) Color and Size of the Northern Goshawk in Southeast Alaska. Craig Flatten, Kimberly Titus, and Richard Lowell.

2) Breeding dispersal of adult northern goshawks in Southeast Alaska. Kimberly Titus, Craig Flatten, and Richard Lowell.

ADF&G personnel continued analysis of data collected since the beginning of this interagency project in 1991. Emphasis was placed on annual monitoring and occupancy of nesting area, fidelity to nesting areas and movement between nesting areas, and efficacy of different monitoring techniques. This data was in the process of being complied and analyzed for a final report for the FS and FWS describing work from 1991 – 1999. This report was previously submitted.

III. ADDITIONAL FEDERAL AID-FUNDED WORK NOT DESCRIBED ABOVE THAT WAS ACCOMPLISHED ON THIS PROJECT DURING THIS SEGMENT PERIOD

Resource agencies are interested in conserving and managing for goshawks so that there is no need to list the species under the Endangered Species Act (ESA). Because of forest management and ESA issues, the US Fish and Wildlife Service (FWS) has needed information about the Queen Charlotte goshawk (*A. g. laingi*) as related to ongoing litigation about the status of the subspecies related to an ESA petition. The FWS contracted Sandra Talbot (USGS-BRD, Alaska Science Center) to examine genetic relationships among goshawks in Southeast Alaska relative to populations in other locations. ADF&G sent blood samples from 131 northern goshawks from Southeast Alaska to Ms. Talbot's lab and spent considerable time facilitating the acquisition of tissue samples (i.e., blood) from goshawk researchers in British Columbia to facilitate this genetic analysis. Information from this analysis may be able to collaborate morphological data that suggests that the goshawks from Southeast Alaska exhibits differences that allow it to be considered a separate subspecies.

IV. RECOMMENDATIONS FOR THIS PROJECT

The eleventh field season of this cooperative study was completed in 2001. During this reporting period, we recommended that the FS continue considering how they would conduct goshawk monitoring efforts as ADF&G staff devoted less time to fieldwork and interagency coordination and more time to data analysis and report preparation. Several discussions among division staff and between division and FS staff, including a meeting with all interagency cooperators, were held to discuss monitoring alternatives and other data needs for this project, to shape the future of this project, and to direct ADF&G's role in the research.

V. PUBLICATIONS

None

VI. FEDERAL AID TOTAL PROJECT COSTS FOR THIS SEGMENT PERIOD

$ 30,000 Federal Share

$ 50,000 State Share

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APPROVAL DATE: _____

Table 1. Activity status of known northern goshawk nest areas in the Ketchikan Area of the Tongass National Forest in Southeast Alaska, 1991-2001; codes defined beneath table.

Nest Area	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Butterball Lake, Heceta Island				O	N A R	O	O	O	O	O	X
Carroll River, Revilla.Island						G	N A	G	G	O	X
Convenient Cove, Hassler Island		G	G	N A	G	G	O	O	O	O	O
Derrumba Ridge, Heceta Island							N O	O	O	O	X
Logjam Creek, P.O.W. Island			N A R	O	O	O	O	O	O	O	O
Margaret Lake, Revilla.Island				N A	G	B R	B R	B R	O	O	O
McDonald Lake, Cleveland Peninsula									N A	G	O
Port Refugio, Suemez Island	O	G	G	B	G	G	O	O	O	O	X
Rio Roberts/Cutthroat Crk., P.O.W. Is.					N A R	B R	B R	B R	O	O	O
Sarheen Creek, P.O.W. Island	G F	G	G	O	O	O	O	O	O	O	O
Sarkar Lake, P.O.W. Island		N A R	O	O	G	O	O	O	O	O	O
Thorne Island, Thorne Island											N A
Timber Knob, Heceta Island						N A	B	C(96) R	B R	C(97)	B
Traitors Creek, Revilla.Island				N A R	B R	O	O	O	O	O	O
Twelvemile Arm, P.O.W. Island						N O	O	O	O	X	X

A = active nest first located.
B = active alternate nest located.
C = previously known active nest reused; ( ) = year first active.
F = fledgling(s) observed, active nest not located.
G = goshawk(s)/activity observed during breeding season, active nest not located.
N = nest area documented this year.
O = no goshawk/activity observed, active nest not located.
R = adult(s) radiotagged and/or present.
X = area not checked.

Table 2. Activity status of known northern goshawk nest areas in the Stikine Area of the Tongass National Forest in Southeast Alaska, 1991-2001; codes defined beneath table.

Nest Area	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Big Creek, Mitkof Island											N A
Big John Creek, Kupreanof Island		N A	B R	O	O	O	O	O	O	O	X
Brown Cove, Petersburg Mainland								N A	B R	O	B
Camp Carl, Etolin Island							N A R	B R	B R	C(99)	O
Cat Creek, Cape Fanshaw Mainland				N A R	O	O	X	O	O	O	X
Doughnut, Wrangell Island									N A R	B	O
Duncan Creek, Kupreanof Island				N A	O	O	G	O	B R	B R	B R
East Bay of Pillars, Kuiu Island				N A R	B R	X	B R	O	O	O	X
Elena Bay, Kuiu Island								N A R	B R	B	X
Farragut Bay, Petersburg Mainland									N A R	B	X
Irish Lakes, Kupreanof Island						N A	G	O	O	O	X
Kadake Bay, Kuiu Island						N A R	O	O	O	O	X
Kake, Kupreanof Island (area cut in	X	X	X	X	X	X	X	X	X	X	X
Kuakan, Deer Island							N A	B	B R	O	O
Madan Bay, Wrangell Mainland								N G F	B R	C(99)	O
Mitchell Creek, Kupreanof Island				N A R	B	O	O	O	O	O	O
Mossman Inlet, Etolin Island	X	O	O	X	X	X	X	X	O	X	X
Mountain Point, Kupreanof Island				N A R	O	X	O	O	O	XO	X
Negro Creek, Port Houghton Mainland				N A	G	O	O	O	O	X	X
Rowan Creek, Kuiu Island			N A R	R T	G	O	G	O	O	X	X
Sanborn Canal, Port Houghton				N A	O	O	X	G	O	X	X
Security Bay, Kuiu Island							N A R	O	O	X	X
Shady, Wrangell Island										N A	C(00)
Starfish, Etolin Island	N A	O	O	O	O	X	O	O	B R	O	O
Totem Camp, Kupreanof Island				N A	O	X	O	O	O	X	X
Tunehean Creek, Kupreanof Island								N A	B R	O	X
Upper Totem, Kupreanof Island			N O	O	O	X	G	O	O	O	X
Vank Island											N A
West Bay of Pillars, Kuiu Island				N A R	B R	X	O	O	O	O	X
Zim Creek, Kupreanof Island									N A	X	X

A = active nest first located.
B = active alternate nest located.
C = previously known active nest reused; ( ) = year first active.
F = fledgling(s) observed, active nest not located.
G = goshawk(s)/activity observed during breeding season, active nest not located.
N = nest area documented this year.
O = no goshawk/activity observed, active nest not located.
R = adult(s) radiotagged and/or present.
T = radiotagged adult present but did not nest.
X = area not checked.

Table 3. Activity status of known northern goshawk nest areas in the Chatam Area of the Tongass National Forest in Southeast Alaska, 1991-2001; codes defined beneath table.

Nest Area	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Auke Bay, Juneau Mainland								N A R	O	O	O
Blueberry Hill, Douglas Island			N A R	B R	C(93) R	R T	C(94) R	B R	B R	C(94)	C(99)
Dewey Lake, Skagway Mainland	X	X	X	X	X	X	X	X	X	X	X
Distin Lake Trail, Admiralty Island				N A	X	X	B	O	B	O	X
Duffield Peninsula, Baranof Island				N A	C(94)	C(94)	O	X	B	O	X
Eagle Creek, Douglas Island			N A R	R T	O	O	O	O	O	O	O
Eagle River, Juneau Mainland							N G F	A R	B R	G	B
Fish Creek, Douglas Island				N A R	B R	B R	B R	C(96) R	B R	O	O
Florence Bay, Chichagof Island						N A R	O	O	O	O	X
Green Cove, Admiralty Island						N A R	B R	B R	C(96) R	B	X
Lace River, Berners Bay Mainland				N A R	R T	O	O	O	X	O	X
Mud Bay River, Chichagof Island			N A	G F	O	X	O	C(93)	O	O	X
Nugget Creek, Juneau Mainland			N A R	B R	R T	O	C(93) R	C(94) R	O	O	O
Pavlof River, Chichagof Island					N A R	R T	R T	O	O	O	X
Point Bridget, Juneau Mainland		N A	B R	O	G	G	G	B R	B	O	O
Ready Bullion Creek, Douglas Island	N A	B R	O	O	O	O	C(91) R	B R	C(92) R	O	O
Sitkoh River, Chichagof Island									N A	O	X
Tolch Rock, Juneau Mainland									N A R	O	O
Turner Lake, Juneau Mainland						N G F	A	G	G F	G F	X
Whitestone, Chichagof Island					N G F R	A R	O	O	O	X	X

A = active nest first located.
B = active alternate nest located.
C = previously known active nest reused; ( ) = year first active.
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